REMARKS

A total of 44 claims remain in the present application. The foregoing amendments are presented in response to the Office Communication mailed November 1, 2006, wherefore reconsideration of this application is requested.

By way of the above-noted amendments, claims 1, 22, 34 and 40 have been amended to more precisely define features of the present invention. In particular, the present invention provides methods and systems for monitoring performance of a multi channel optical communications system, in which, for each channel (Ch.(a)...Ch.(n), FIG. 2) a respective channel A/D converter 14 samples the respective channel signal, and a respective channel monitor 30 taps and stores samples generated by the A/D converter 14 during a predetermined time interval. A DSP 32 operates independently of each of the channels, and calculates performance parameters of the optical communications system based on the sample data received from each of the channel monitors. Independent claims 1, 22, 34 and 40 have been amended to more clearly define these relationships between each of the components of the system. Clearly, no new subject matter has been introduced.

Referring now to the text of the Office Action, claims 1-44 stand rejected under 35 U.S.C. §103(a), as being unpatentable over the teaching of United States Patent Application Publication No. 2002/0012152 (Agazzi et al) in view of United States Patent Application Publication No. 2005/0078957 (Hendow);

The above objections are believed to be traversed in view of the above-described claim amendments, and further in view of the following discussion.

As an initial matter, the Examiner's application of the teaching of Aggazi et al to the original claims is not understood. In particular, with reference to claim 1, the Examiner asserts that Aggazi et al teaches "a channel monitor adapted to the data path to obtain sample data generated by the A/D converter 108 within a predetermined time interval, the sample data comprising sequential N-bit samples respectively indicative of detected analog value of the

channel signal (page 4, paragraphs 0089, 0091); and a DSP 110 for calculating at least one performance parameter of the optical communications system based on the sample data, independently of the data decoder (page 4, paragraphs 0090, 0091, 0096)".

Thus the Examiner refers to the same paragraphs to find a teaching of both the claimed channel monitor and the DSP. However, the paragraphs cited by the Examiner refer to exactly one component, the "DSP-based receiver 100", which is itself composed of ADC 108 and DSP 110 connected in series.

With reference to ADC 108, Aggazi et al are utterly silent regarding the resolution of the analog-to digital conversion. More particularly, Aggazi et al do not teach or suggest that the samples output from the A/D converter are N-bit samples , where N>1, as required by the present invention. In that respect, it will be noted that in paragraph 0091, Aggazi et al teach that the ADC and/or DSP can be "implemented with multiple parallel paths, wherein each path operates at a lower speed relative to the data signal 102". However, the person of ordinary skill in the art will instantly recognise that this teaching refers to the commonly used technique of inverse-muxing a high-speed signal to obtain multiple lower-speed signals, each of which can be processed at a lower speed. The person of ordinary skill in the art will also instantly recognise that there is utterly impossible to confuse the generation of multiple low speed signals , as per Agazzi et al, and the generation of a multi-bit signal as provided by the present invention

With reference to the DSP 110, Aggazi et al explicitly teach that the DSP 110 performs digital processes including "without limitation, equalization, error correction (such as hard or soft decoding of, without limitation, convolutional, trellis or block decodes) timing recovery, automatic gain control, and offset compensation" (paragraph 0090). As such, the person of ordinary skill in the art will instantly recognise that Aggazi's DSP 110 relates to the decoder 18 illustrated in FIG. 2 of the present application. It is simply impossible to rationally relate Aggazi's DSP 110 to either the channel monitor 30 or DSP 32 of the present invention. In particular:

- With reference to the claimed channel monitor, Aggazi's DSP 110 forms an integral part of the DSP-based receiver: 100, and as such receives each and every sample output by the ADC 108. Accordingly, Aggazi's DSP 110 cannot be described as receiving samples within a predetermined time interval, without expanding the assumed length of that time interval to such an extent as to render the claim limitation meaningless. Furthermore, Aggazi et al do not teach or suggest that samples received from the ADC 108 are stored, in any meaningful sense. In that respect, it will be noted that Aggazi et al do not mention a memory which could be used for storage of samples received from the ADC. In fact the only occurrence of the word "memory" anywhere in the entire application appears in figure 24 showing a parallel Viterbi processor. The terms "store", "storage" or "time interval" do not appear anywhere in the Aggazi et al application.

- With reference to the claimed processor, Aggazi's DSP 110 <u>is</u> the data decoder (see paragraphs 0088-0097), and as such cannot possibly perform <u>any</u> operations "independently of the data decoder", as asserted by the Examiner.

In light of the foregoing, it will be plainly obvious that Aggazi et al do not teach or fairly suggest either the channel monitor or the processor of the present invention. Hendow does not provide the missing teaching.

On page 3 of the Detailed Action, the Examiner relies on United States Patent Application Publication No. 2005/0078957 (Hendow) as teaching a "sample memory 274 adapted to receive successive samples from the A/D converter 278 and a controller 270 adapted to control the sample memory to store samples received during the predetermined time interval." According to the Examiner, it would have been obvious "to include sample memory 274 taught by Hendow in the system of Agazzi…in order to detect the symbols conveyed by the channel signal, and thereby recover the original data stream." With respect, the Examiner's logic is not understood.

Aggazi et al explicitly teaches methods and systems adapted to "detect the symbols conveyed by the channel signal, and thereby recover the original data stream". That, after all, is the entire, indeed the only, purpose of Aggazi's DSP-based receiver 100 (see Aggazi et al, paragraphs 0087-0097). Adding a sample memory to Aggazi's system, as proposed by the Examiner, would do exactly nothing to enhance this functionality. Furthermore, it is far from apparent how the mere addition of a sample memory, as proposed by the examiner, would accomplish the alleged advantage of enabling detection of symbols to thereby recover the original data stream. As such, there appears to be motivation to modify the system of Aggazi et al in the manner suggested by the Examiner, and no suggestion that such a modification would accomplish the proposed result.

Hendow provides a digital spectrum analyser. Referring to FIG. 7, wavelengths 262 of an input optical signal 252 are separated and made incident on a detector array 260. The analog voltage measured by each element 258 of the detector array 260 is clocked out of the array and supplied to an analog-to-digital (A/D) converter 278, and resulting sample values 282 supplied to a digital signal processor 270, which utilizes a memory 274.

There appears to be no means by which the system of Hendow could be incorporated into the system of Aggazi et al, to yield anything like the presently claimed invention. In particular, the processor of Hendow does compute "at least one performance parameter of the optical communication system". However, according to Hendow, this calculation is based on digital samples representative of the optical spectrum (that is, the variation in optical power with wavelength) of the input optical signal. Hendow's processor does not perform digital signal processing of sample data accumulated from a A/D converter which samples the "channel signal at a predetermined sample rate at least equal to a baud rate of the channel", as required by the claims, and there is no teaching or suggestion in Hendow of how his system could be modified to use such data. Figure 1 of Hendow shows that his system can be connected to receive a singe optical wavelength channel, or alternatively multiple wavelength channels, as the input optical signal 252. However, Hendow does not teach or suggest a system in which respective sample data is accumulated fore each channel, and performance parameters calculated by a processor independently of each channel, as required by the present invention.

In light of the foregoing, it is believed that the present invention is clearly distinguishable over the teachings of the cited references, taken alone or in any combination.

If any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this response, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 19-5113.

Respectfully submitted,

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